

due to high temperature heat treatment arises.

Furthermore, as the wire to be a mold of the electron multiplier surface is removed by strong acid etching after forming a coating of diamond and so on, it was

5 necessary to form the electron multiplier surface, which is the coating, as a robust coating that is maintained even without the wire.

SUMMARY OF THE INVENTION

10 The present invention was implemented in order to solve the problem set forth above, and its object is to provide a multi-channel plate that has high resolution and is advantageous for larger area, high resolution design and a manufacturing method thereof.

15 Another object of the present invention is to provide a channel plate having a structure of an electron multiplier surface capable of increasing a secondary electron multiplication factor and the manufacturing method thereof.

20 To be more specific, the channel plate according to the present invention is one having a porous element, and is characterized by the porous element including an aluminum compound.

25 In addition, the channel plate involved in a second invention of the present invention comprises: a substrate; a first electrode placed on the top face of the substrate; and a second electrode placed on the

bottom face of the substrate, wherein the substrate is the porous element having a plurality of pores extending therethrough, and the porous element is formed with a compound including aluminum, and the porous element has an electron multiplier on a wall surface of the pore.

It is desirable that the above described electron multiplier emits secondary electrons due to collision of the electrons with the above described electron multiplier.

It is desirable that the above described electron multiplier has oxide grains of which secondary electron emission coefficient is larger than 1.

It is desirable that the above described porous element has aluminum oxide as its main ingredient.

It is desirable that the above described electron multiplier is formed by coating the wall surface of the pore of the above described porous element.

In addition, a third invention of the present invention is a channel plate manufacturing method comprising the steps of: anodizing aluminum or the substrate of which main ingredient is aluminum to form the porous element having a plurality of pores extending through the substrate; forming the electron multipliers on the wall surface of the pores; and forming the electrodes on the top and bottom faces of the porous element respectively.

It is desirable that the above described step of forming the electron multipliers is a step of coating the wall surfaces of the pores of the above described porous element with a coating layer including a material of which secondary electron emission coefficient is larger than that of the material forming the above described porous element.

It is desirable that the above described coating layer comprises a material of which secondary electron emission coefficient is larger than 1.

It is desirable that the above described aluminum or the substrate of which main ingredient is aluminum is an aluminum film disposed on the electrode to be anodized.

It is desirable that the above described coating layer includes oxide grains.

According to the present invention, it is possible to provide the channel plate wherein a channel having the electron multiplier surface of which electron multiplication factor is improved is formed over large area. It is possible, by using this channel plate, to acquire a large image intensifier of high resolution and large area, which can meet the demand for larger area design and higher performance in recent years.